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THE CONCENTRATION OF MANUFACTURING INDUSTRIES IN VIETNAM WITH PARTICULAR REFERENCE TO HO CHI MINH CITY AND ITS SURROUNDING

*Regional Science Association International - British and Irish Section (RSAI-BIS)
42nd Annual Conference, Sidney Sussex College, University of Cambridge
21st – 22nd August, 2013*

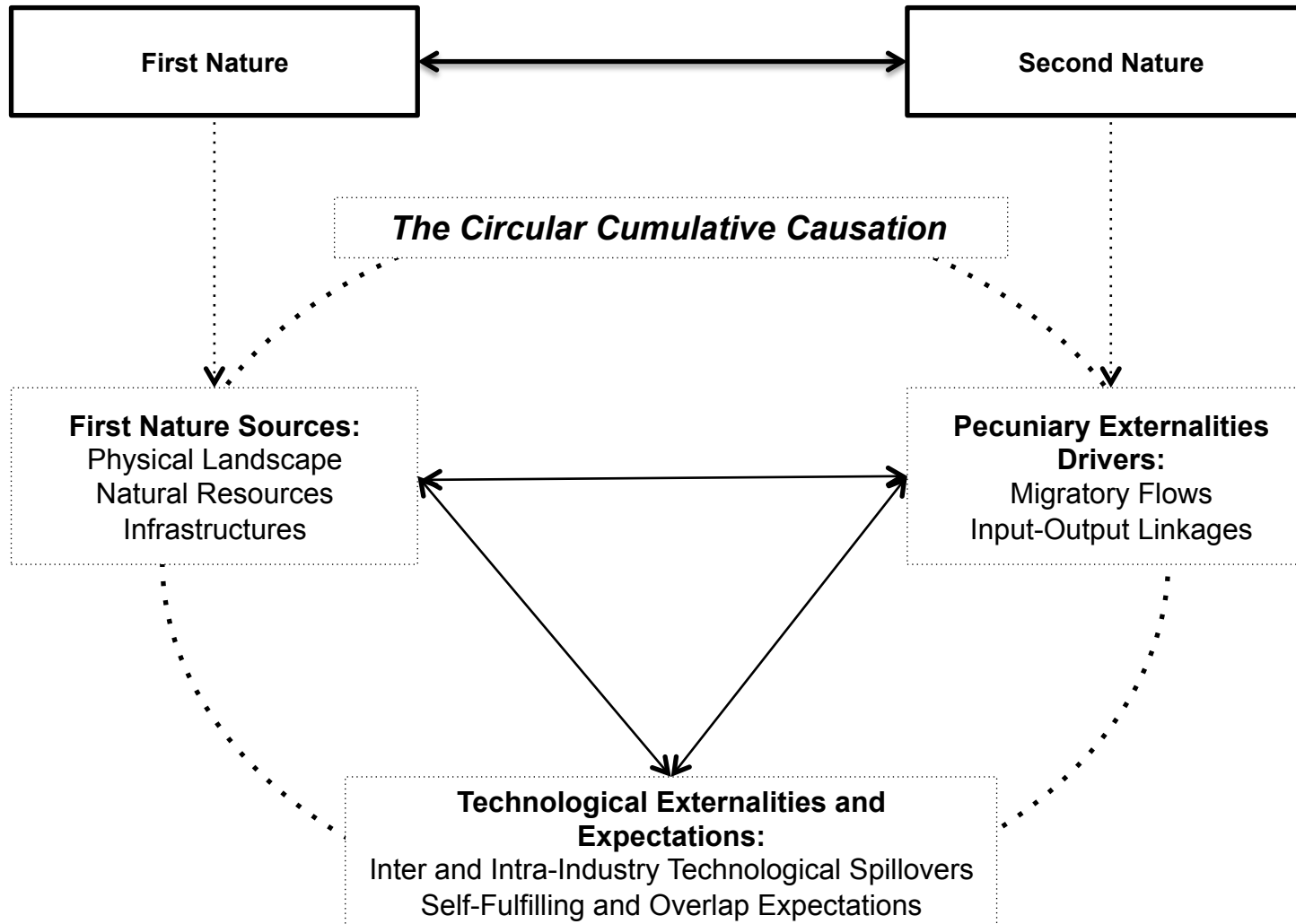
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Motivations and Aims of Study

- Vietnam is one of the most dynamic emerging countries in the South-East Asia in terms of economic growth. Despite this, there is little academic attention to its economic geography, and in particular with reference to the country's agglomeration and industrial concentration.
- The research aims to investigate the economic agglomeration and concentration of manufacturing industries in Vietnam with particular reference to Ho Chi Minh and its surrounding provinces using a-spatial and spatial statistics.

**THEORETICAL FRAMEWORK
AND METHODOLOGY:
THE ECONOMIC COLOCALIZATION FORCES,
DISCRETE AND SPATIAL STATISTICS**

The Determinants of Colocalization and Delocalization Forces



A-spatial Statistics

Location quotient (LQ) in order to measure the relative industrial specialization:

$$LQ_{r,i} = \frac{E_{r,i} / \sum_{i=1}^N E_{r,i}}{\sum_{r=1}^R E_{r,i} / \sum_{i=1}^N \sum_{r=1}^R E_{r,i}}$$

Locational Gini index to measure the relative industrial concentration of employment (Kim 2000):

$$Gini_r = \frac{\Delta}{4\bar{x}}$$

where:

$$\Delta = \frac{1}{N(N-1)} \sum_{i=1}^N \sum_{j=1}^N |x_i - x_j|$$

where:

E = employment

r = two-digit sector

i =location

N = number of observations.

$x_{i(j)} = LQ_{r,i(j)}$

\bar{x} = mean of x

Spatial Autocorrelation

Global Moran's I in order to measure spatial autocorrelation
(Moran, 1948, 1950):

$$I = \frac{\sum_{i=1}^N \sum_{j=1}^N w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^N (x_i - \bar{x})^2}$$

The **local Moran's I** of spatial local association (Anselin, 1995):

$$I_i = \left(\frac{x_i - \bar{x}}{\sum_{i=1}^N \frac{(x_i - \bar{x})^2}{N}} \right) \sum_{j=1}^N w_{ij} (x_j - \bar{x})$$

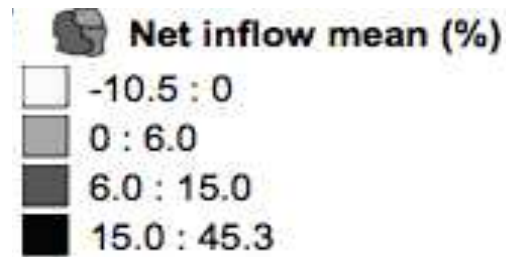
where:

w_{ij} = denotes an
elements of the spatial
weight matrix W , $i \neq j$.

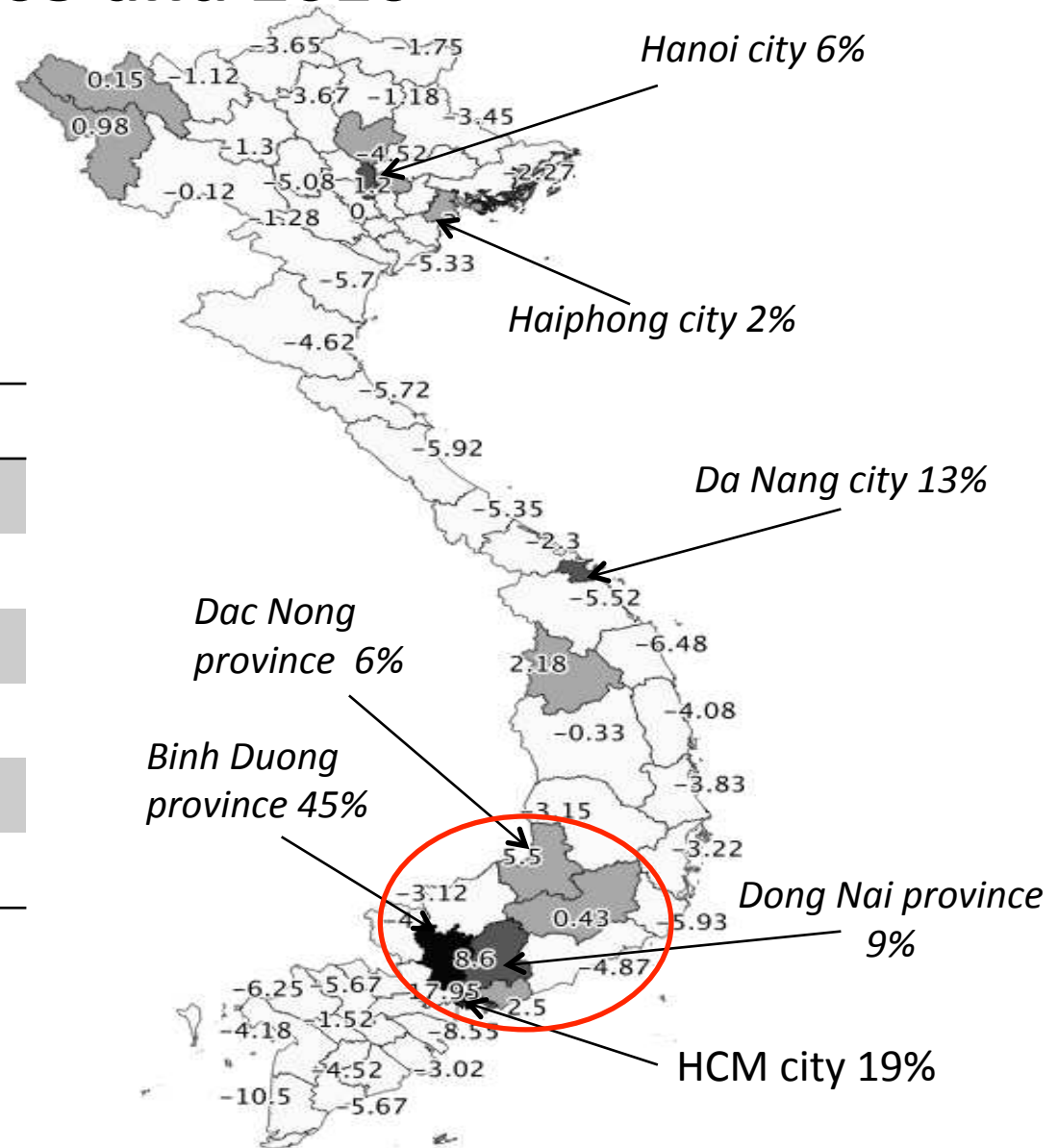
The first-order contiguity spatial weights matrix raw-standardized is employed.

**EMPIRICAL ANALYSIS I:
GEOGRAPHIC AGGLOMERATION OF EMPLOYMENT AND MIGRATION
IN VIETNAM**

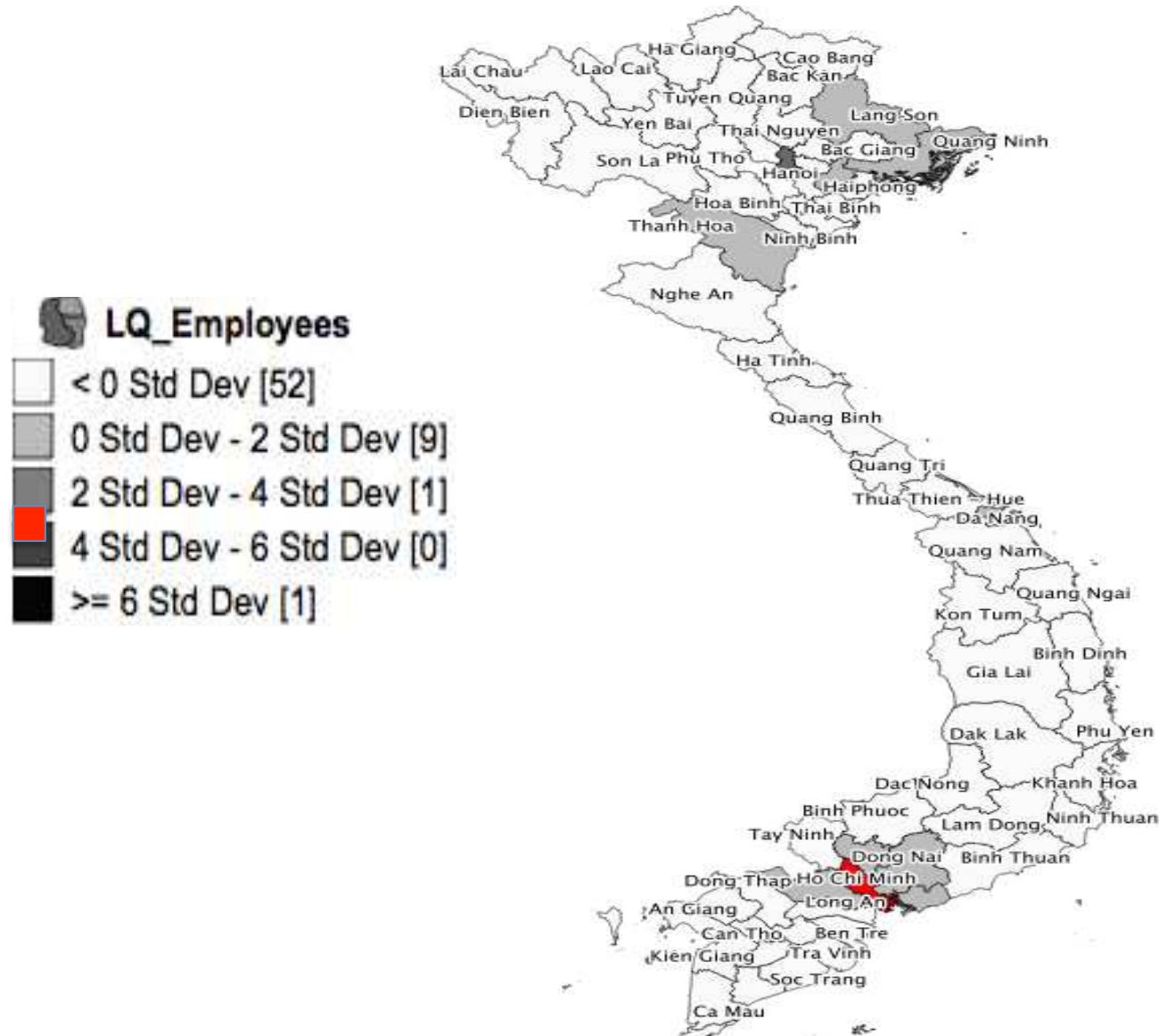
The Average of Net Migration in Vietnam between 2005 and 2010



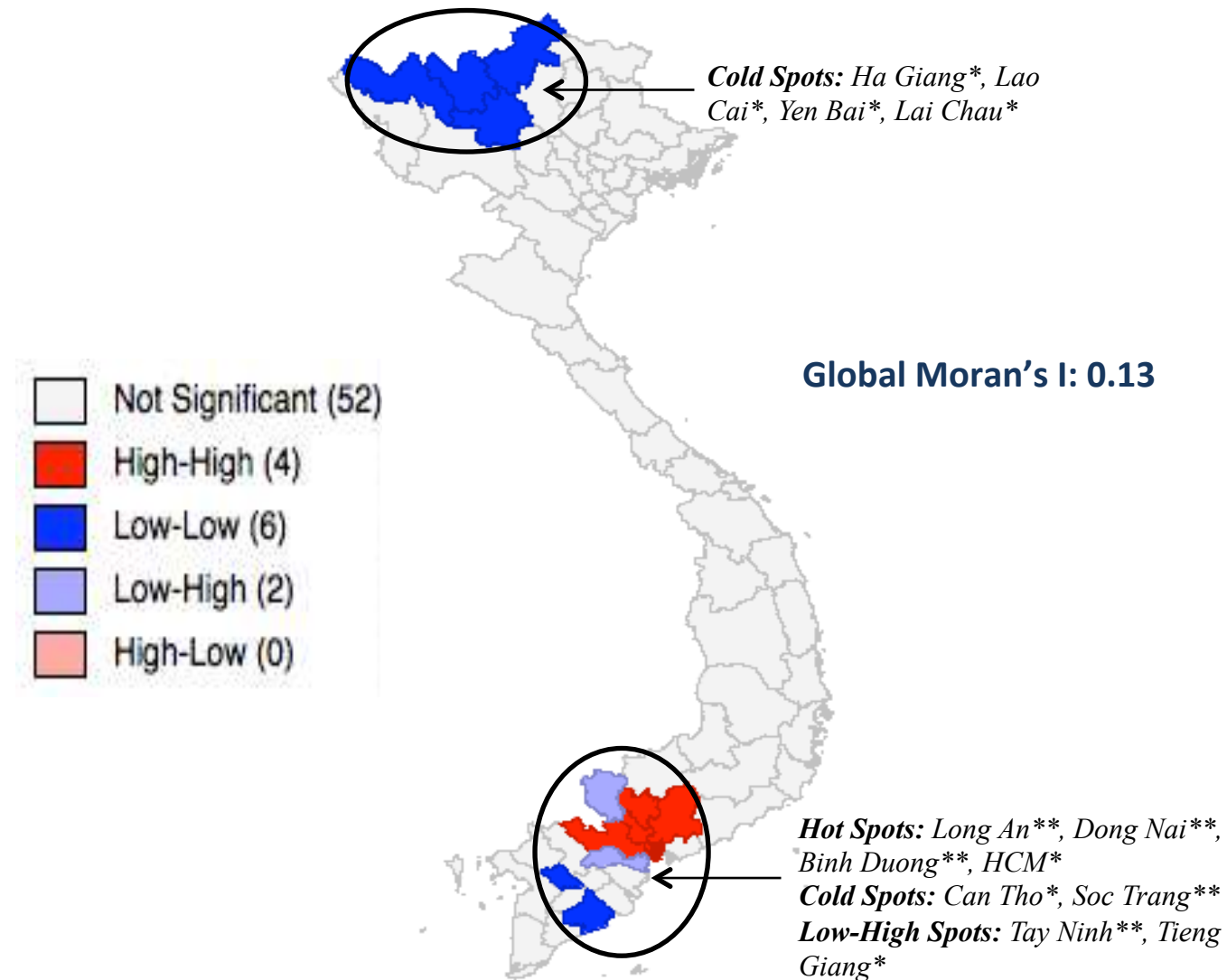
Region	%
South East	14.3
Red River Delta	-0.1
Central Highlands	-0.5
Northern midlands and mountain areas	-2.1
North Central and Central coastal areas	-4.1
Mekong River Delta	-5.5



Average of Manufacturing Specialization within Vietnamese locations in 2010



LISA cluster map of employment in Vietnam in 2010.



* P-value at 0.05, ** p-value at 0.01
999 Permutations

Concentration of Employment in Vietnam

VSIC 2007	Industry	Gini Empl.	Technology intensity*
14	Manufacture of wearing apparel	0.470	Low
15	Manufacture of leather and related products	0.377	Low
10	Manufacture of food products	0.251	Low
23	Manufacture of other non-metallic mineral products	0.144	Medium low
31	Manufacture of furniture	0.137	Low
19	Manufacture of coke and refined petroleum products	0.127	Medium low
12	Manufacture of tobacco products	0.121	Low
25	Manufacture of fabricated metal products (except machinery and equipment)	0.119	Medium low
33	Repair and installation of machinery and equipment	0.114	Medium low
21	Manufacture of pharmaceuticals, medicinal chemical and botanical products	0.109	High
22	Manufacture of rubber and plastics products	0.107	Medium low
11	Manufacture of beverages	0.104	Low
13	Manufacture of textiles	0.104	Low
28	Manufacture of machinery and equipment n.e.c	0.101	Medium high
18	Printing and reproduction of recorded media	0.099	Low
26	Manufacture of computer, electronic and optical products	0.099	High
29	Manufacture of motor vehicles; trailers and semi-trailers	0.096	Medium high
24	Manufacture of basic metals	0.095	Medium low
27	Manufacture of electrical equipment	0.093	Medium high
20	Manufacture of chemicals and chemical products	0.093	Medium high
17	Manufacture of paper and paper products	0.092	Low
16	Manufacture of wood and of products of wood and cork (except furniture)	0.092	Low
30	Manufacture of other transport equipment	0.091	Medium high
32	Other manufacturing	0.091	-

**OECD classification for manufacturing industries.*

**EMPIRICAL ANALYSIS II:
REGIONAL CONCENTRATION AND SPECIALIZATION OF TWO-DIGIT
MANUFACTURING INDUSTRIES IN HO CHI MINH AND ITS
SURROUNDING IN 2011**

Structure of GDP at Current Prices by Economic Sector and Type of Ownership in HCM

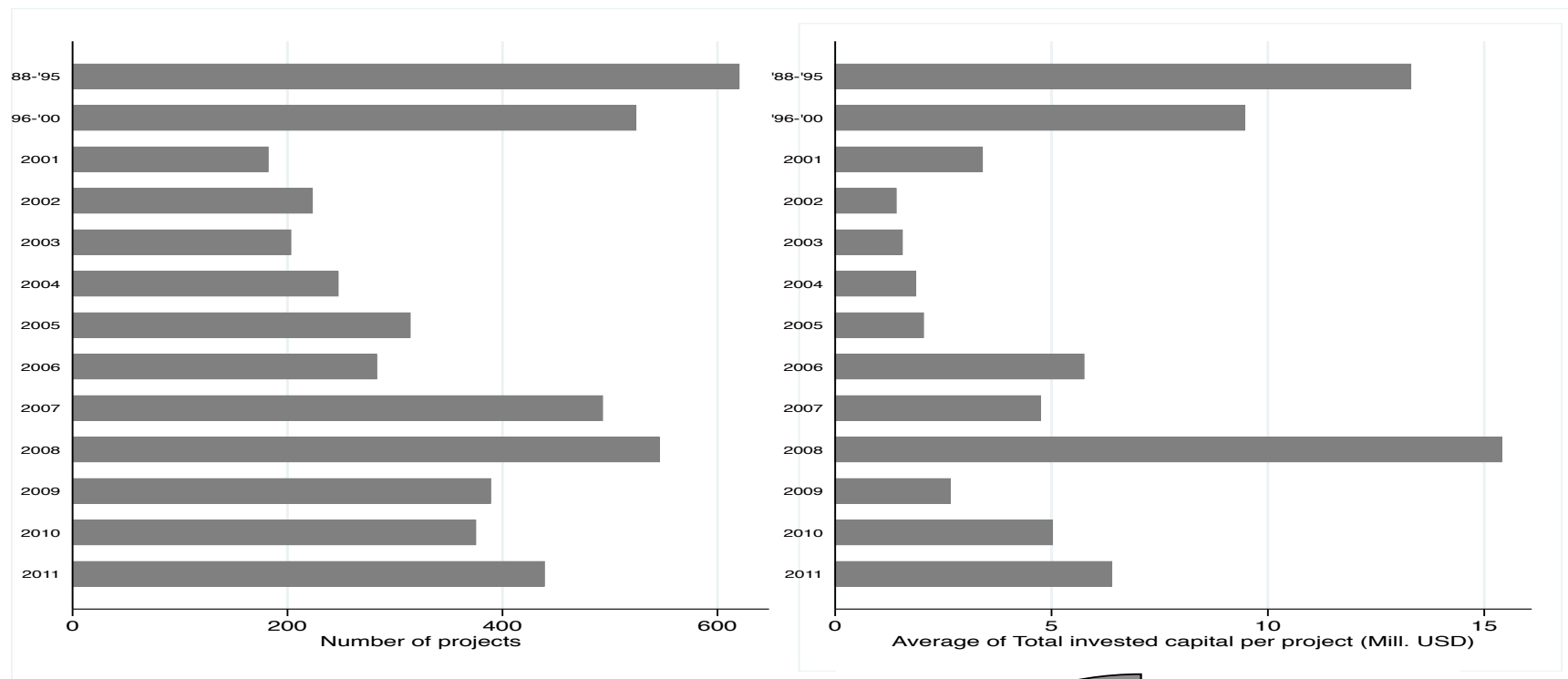
Period	GDP growth rate	GDP Structure of economic sector per year		
		Agriculture, forestry and fishery	Industry and construction	Services
2006	12.2	1,2	47,5	51,3
2007	12.6	1,4	46,5	52,1
2008	10.7	1,4	44,1	54,4
2009	8.6	1,3	44,5	54,2
2010	11.8	1,2	45,3	53,5
2011	10.3	1,2	44.5	54,3

By type of ownership	2005	2008	2009	2010	2011
State	35,0	26,6	25,2	20,3	20,0
Collective	0,7	0,9	0,9	0,8	0,7
Private	25,6	37,4	38,9	43,8	44,0
Household	16,9	12,8	11,8	10,8	10,7
FDI	21,8	22,3	23,2	24,3	24,6

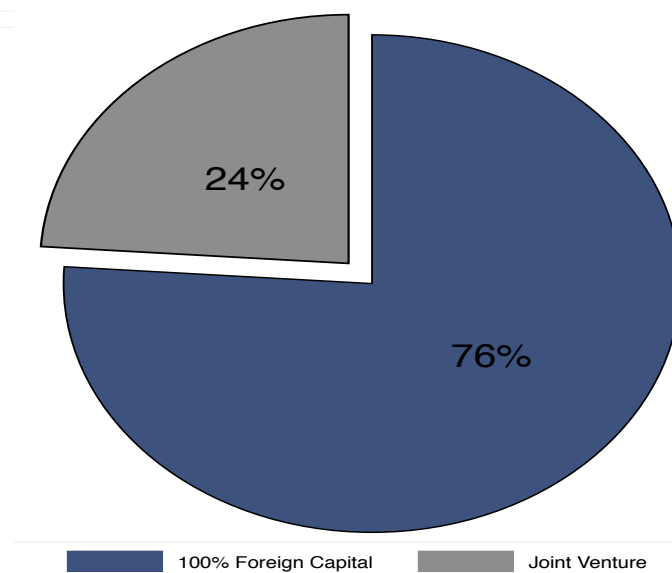
Structure of GDP at Current Prices by Kind of Economic Activity in HCM

By economic activity	2005	2008	2009	2010	2011
Agriculture	0,9	1,2	1,1	1,0	1,0
Forestry	0,0	0,0	0,0	0,0	0,0
Fishery	0,3	0,2	0,2	0,2	0,2
Mining	0,1	0,0	0,0	0,1	0,1
Manufacturing	41,3	37,3	36,9	37,6	37,0
Electricity, gas and water	1,6	1,1	1,0	1,0	0,8
Construction	5,1	5,6	6,6	6,6	6,6
Wholesale and retail trade; repair of moto vehicles, among others	12,6	13,3	13,2	13,5	13,7
Hotels and restaurants	5,0	4,1	4,1	3,9	4,1
Transport, storage and communications	10,1	9,9	9,3	8,9	9,2
Financial intermediation	5,2	11,1	11,9	12,7	13,0
Scientific activities and technology	0,3	0,2	0,2	0,2	0,2
Real estate, renting and business activities	6,6	6,1	5,9	4,8	4,7
Public administration and defence compulsory social security	1,2	1,4	1,6	1,3	1,3
Education and training	3,1	2,3	2,2	2,2	2,2
Health and social work	3,3	3,2	3,2	3,6	3,4
Recreational cultural and sporting activities	1,7	1,2	1,1	1,0	1,0
Activities of membership organizations	0,1	0,1	0,1	0,1	0,1
Community, social and personal service activities	1,0	1,3	1,2	1,1	1,1
Private households with employed persons	0,2	0,2	0,2	0,2	0,2

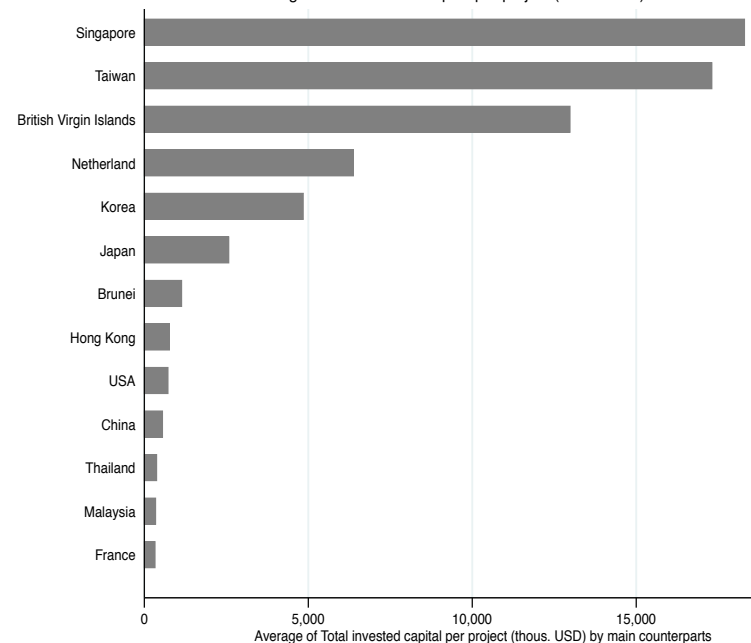
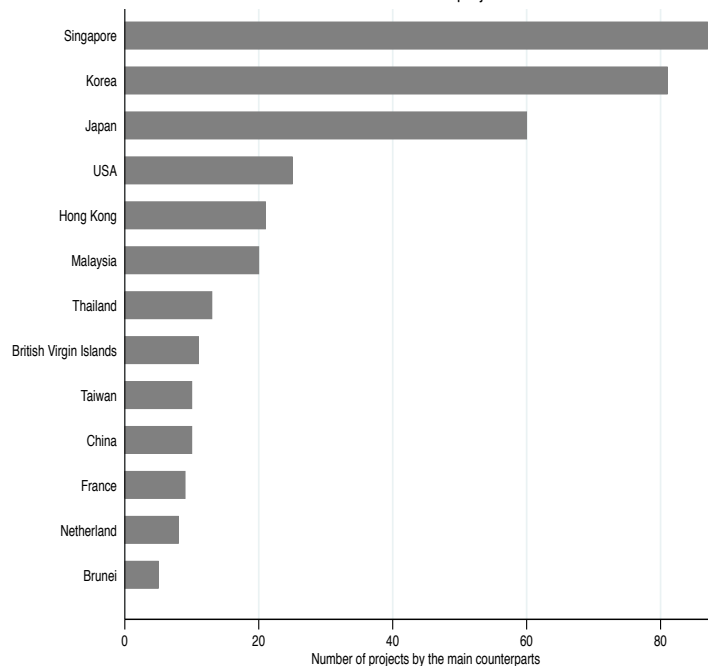
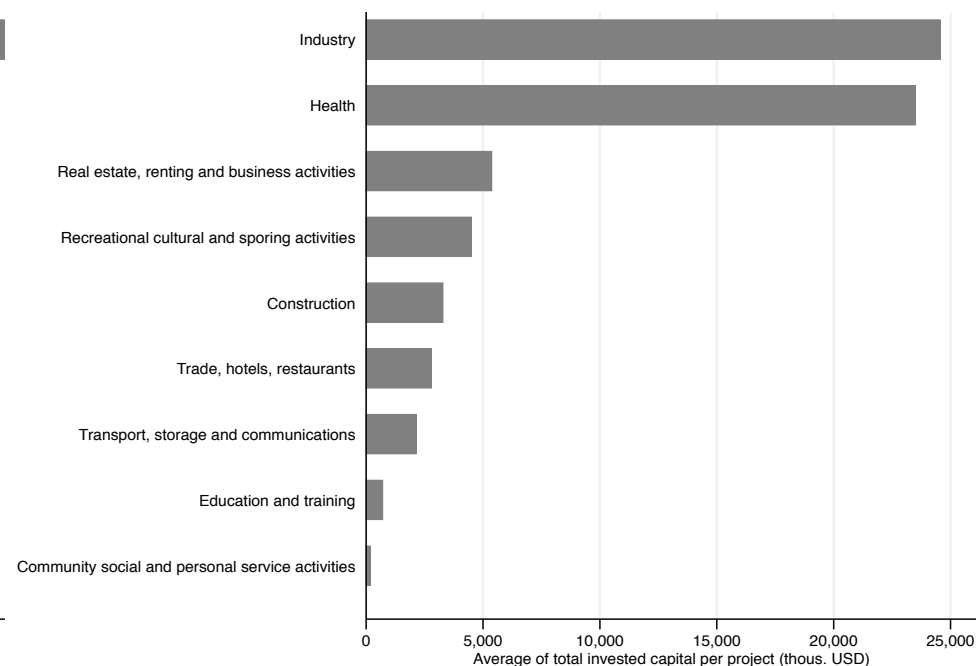
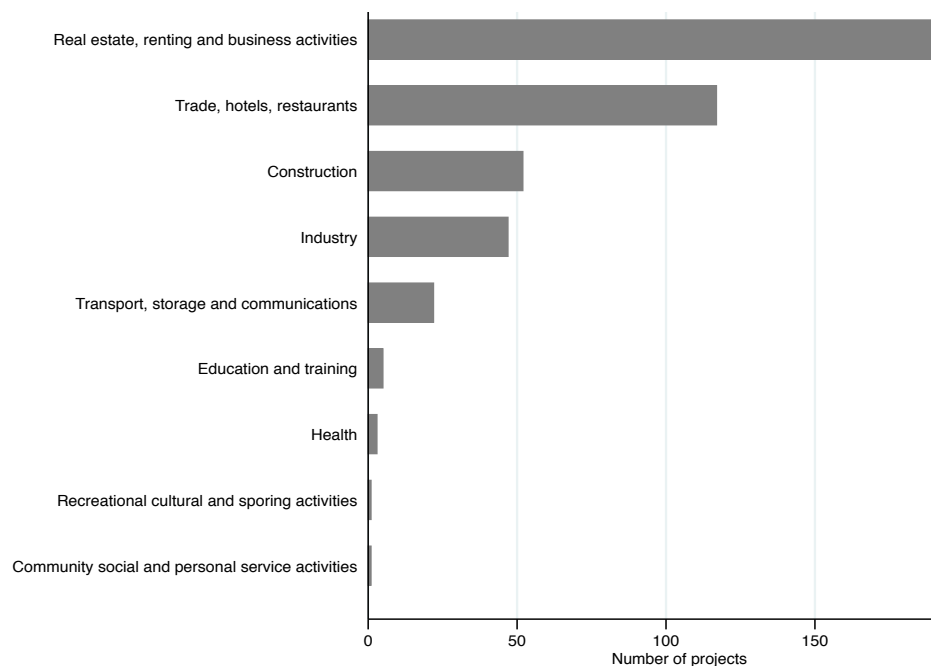
FDI Projects Licensed by Year Licensed in HCM



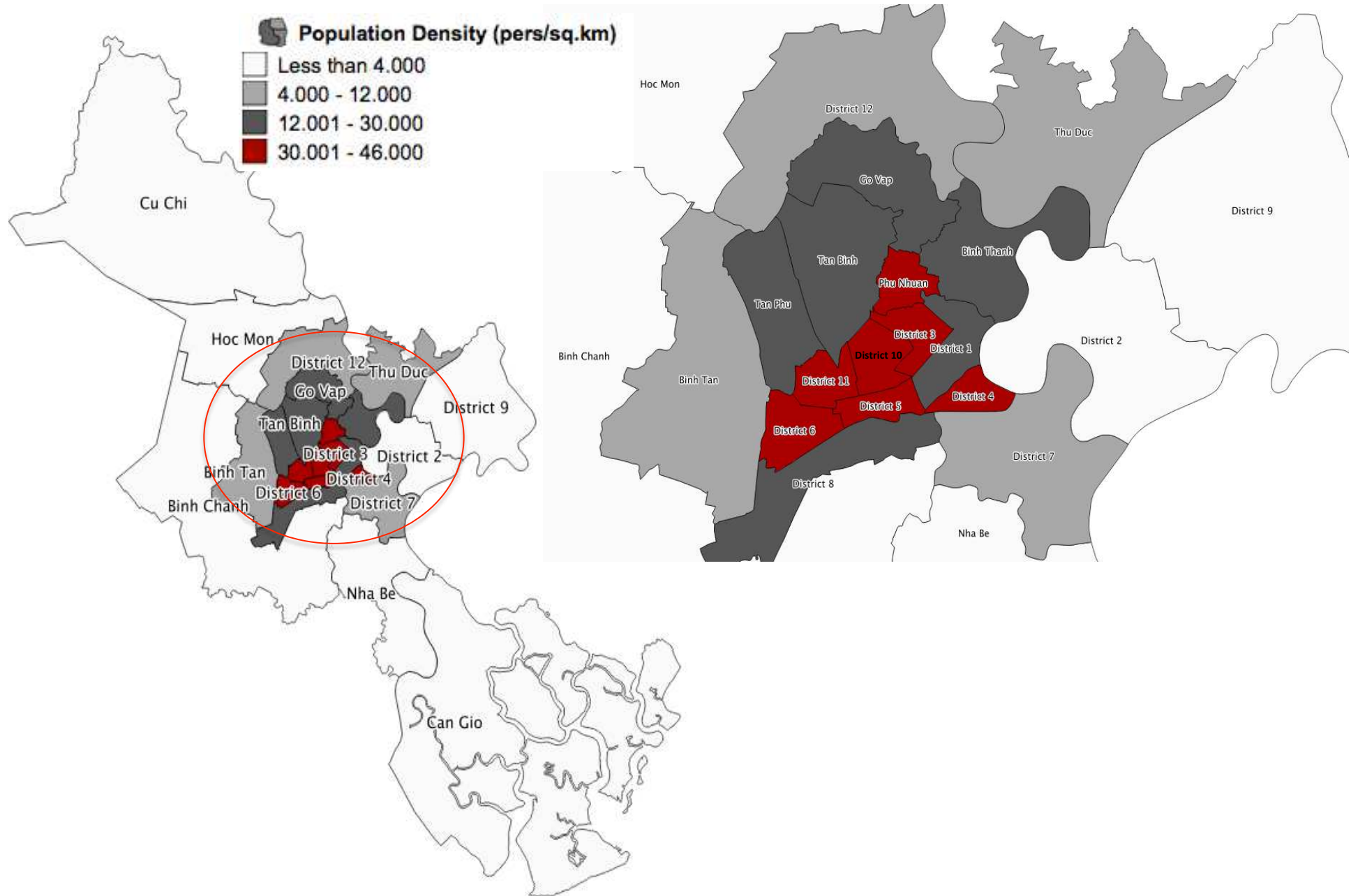
FDI Projects Licensed in 2011 by Type of Investment



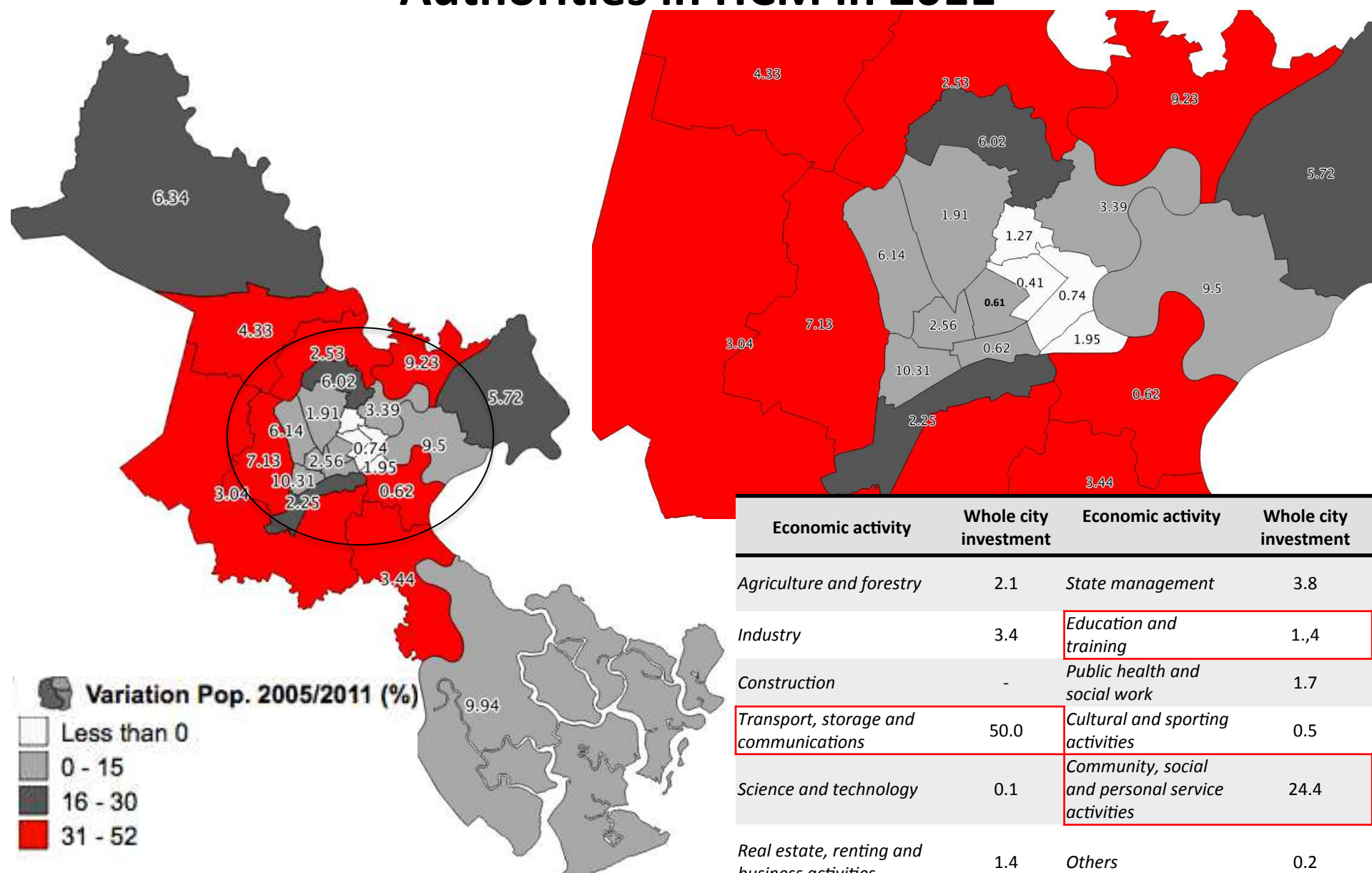
FDI Projects Licensed in 2011 and the Main Counterparts in HCM



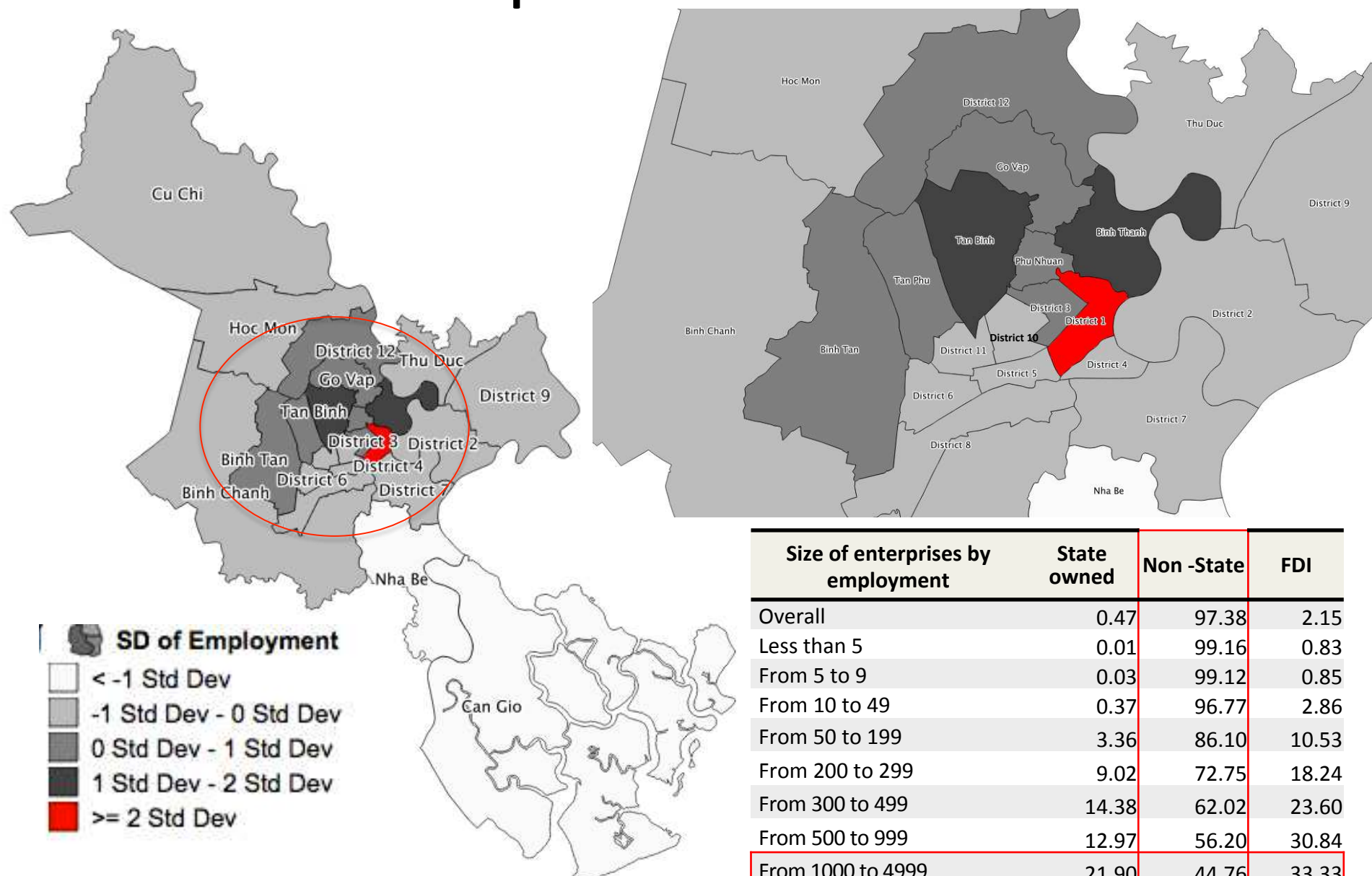
HCM – Population Density 2011



Variation of Population 2005/2011 and Investment by Local Authorities in HCM in 2011



Employment Concentration by District of Non-state Enterprises in HCM in 2011



Size of enterprises by employment	State owned	Non -State	FDI
Overall	0.47	97.38	2.15
Less than 5	0.01	99.16	0.83
From 5 to 9	0.03	99.12	0.85
From 10 to 49	0.37	96.77	2.86
From 50 to 199	3.36	86.10	10.53
From 200 to 299	9.02	72.75	18.24
From 300 to 499	14.38	62.02	23.60
From 500 to 999	12.97	56.20	30.84
From 1000 to 4999	21.90	44.76	33.33
From 5000 and over	22.22	38.89	38.89

Univariate Local Autocorrelation of Employment of Non-state Enterprises in HCM in 2011

LISA Cluster Map: VNM_



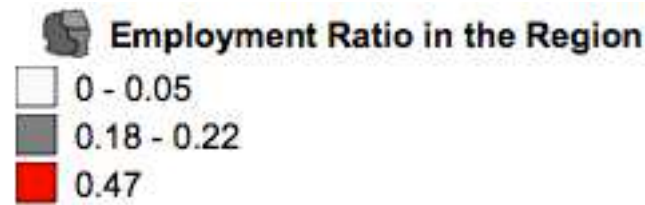
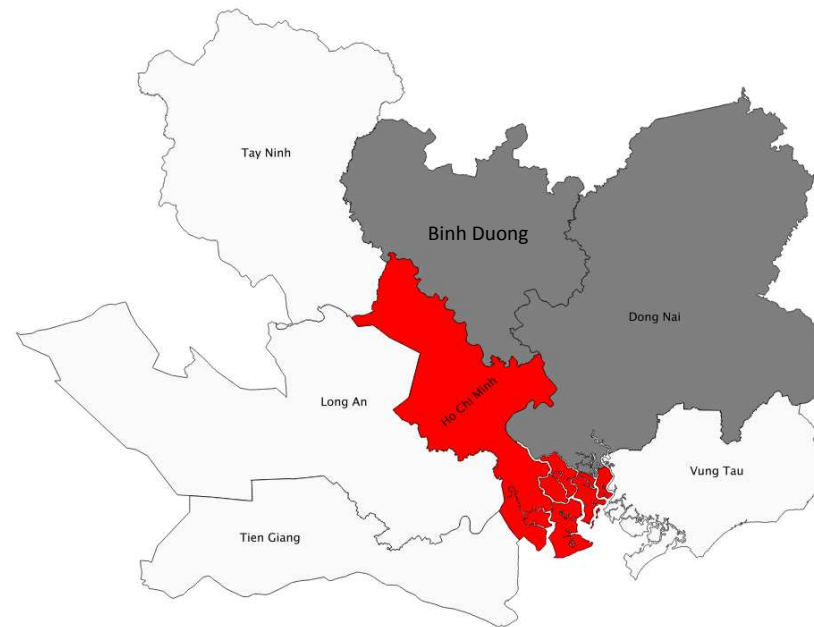
P-value at 0.05
999 Permutations

Global Moran's I = 0.30



Regional Ratio of Employment within Manufacturing Industries in HCM and its Surrounding in 2011

*Regional Ratio of Employment
in Manufacturing industries*



Regional Concentration and Specialization of Selected Industries in HCM and its Surrounding in 2011

VSIC 2007	Industry	Specialization (LQ > 1)	Gini
14	Manufacture of wearing apparel	Tay Ninh (17), Long An (4), Binh Duong (1)	0.37
16	Manufacture of wood and of products of wood and cork (except furniture)	Tay Ninh (2)	0.37
10-11	Manufacture of beverages-Manufacture of food products	Tay Ninh (10), Long An (6)	0.36
22	Manufacture of rubber and plastics products	Tay Ninh (3), Long An (1)	0.32
23	Manufacture of other non-metallic mineral products	Tay Ninh (2)	0.31
15	Manufacture of leather and related products	Tay Ninh (12), Long An (9), Dong Nai (2), Binh Duong (1)	0.3
25	Manufacture of fabricated metal products (except machinery and equipment)	Tay Ninh (3), Long An (1)	0.3
13	Manufacture of textiles	Tay Ninh (2), Long An (1)	0.27
31	Manufacture of furniture	Binh Duong (2), Dong Nai (1), Tay Ninh (1)	0.15

CONCLUSIONS

Conclusions

- Vietnam was characterized by high provincial inequalities where Hanoi and Ho Chi Minh played a predominant role in the Vietnamese economy, as they attracted large part of the country's business activities. The migratory flows strengthened this socio-economic imbalance among provinces.
- High economic polarization emerged in the South of the country in particular within Ho Chi Minh City and nearby provinces favouring an integrated region.
- In HCM, service industries grew faster than other industries between 2005 and 2011 with particular reference to financial intermediation.

Conclusions (Cont.)

- The weight of state-owned firms considerably decreased between 2005 and 2011 within the city's economy, whereas private businesses and FDI constantly increased. Singapore, Taiwan and British Virgin Island are the largest partners In terms of capital invested per FDI's project.
- The population density by districts was concentrated in a concentric form in HCM in 2011, where the center was the most dense and the number of inhabitants decreased when the distance increased from the core. However, the variation of population significantly increased within the periphery (rural districts) between 2005 and 2011.
- The highest concentration of economic activities was in the District 1 in 2011. The state-owned firms and FDI in HCM was characterized by large number of employment.

Conclusions (Cont.)

- Significant Hot-spots (HH) are identifiable in nearby districts in HCM such as District 12, Go Vap, Phu Nhuan and District 3.
- Ho Chi Minh, Binh Duong, Dong Nai, Long An, Tay Ninh, Vung Tau and Tien Giang held more than 40% of country's employment in 2011.
- Tay Ninh and Long An are the most specialized locations in particular with reference to beverages and food products, wearing apparel, leather and related products. Whereas, HCM was characterized by an overall high employment concentration though no industries showed a predominant localization within the city in terms of number of employment.
- The manufacturing of wearing apparel, and manufacturing of wood and products of wood and cork (except furniture) had the highest concentration in the South region in 2011. Whereas the manufacture of furniture had the lowest concentration coefficient.



THANK YOU

Q&A

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